

The buyer can defer a decision by clicking a 'review later' button 35. When the buyer reaches a decision, this is effected by clicking on a 'participate' button 36 or a 'do not participate' button 37 as appropriate, and is notified directly to the matched selling user. The server 10 can be informed of the buyer's decision for the purpose of information logging by copying the decision notification to the server 10.

An interface 33 such as that of Figure 6 also records the time, date and reserve price of the proposed auction in fields 38, 39 and 40 and can remind its user when the auction is about to begin. The user can use option buttons 41 to decide at this point whether they would like to bid automatically, in which case they enter a highest price and bid increment in fields 42 and 43, or 'live' when the auction is actually occurring. The other user's participation status – 'live' or 'automatic' – appears in field 44.

Once matches between a seller and possible buyers have been made and the necessary communications established, the elements are in place for an auction to occur. The auction process allows the seller's software to become a server and to serve the entire auction process, as shown in Figure 7.

More closely to simulate a live auction, the invention optionally involves an agent such as a seller agent A reporting the changing status of an auction to a group of other agents participating in an auction, the other agents being buyer agents  $B_1$ ,  $B_2$ ,  $B_3$  in this example that are issuing competing bids for an item offered by the seller agent A.

For example, the seller agent A can inform all of the participating buyer agents  $B_1$ ,  $B_2$ ,  $B_3$  of the fact that an increased bid has been received from one of the buyer agents  $B_1$ ,  $B_2$ ,  $B_3$ . Another example is where the seller agent A informs the group of buyer agents  $B_1$ ,  $B_2$ ,  $B_3$  that one of their number has dropped out of the auction. The buyer agent  $B_1$ ,  $B_2$ ,  $B_3$  that issued the bid or dropped out may be kept anonymous or its identity may be made known to the other buyer agents  $B_1$ ,  $B_2$ ,  $B_3$ . Either way, a buyer agent  $B_1$ ,  $B_2$ ,  $B_3$  can respond to the activity of competing buyer agents  $B_1$ ,  $B_2$ ,  $B_3$ , for example by submitting an increased bid to exceed other bids or by withdrawing from the auction if the price of the item concerned has gone beyond its user's willingness to pay. The buyer

agent B<sub>1</sub>, B<sub>2</sub>, B<sub>3</sub> can respond automatically in accordance with parameters pre-set by the user, or under the real-time control of the user.

The changing status of an auction can be expressed as an auction timeline displayed on the buyers' terminals. An example of such a timeline is as follows:

5	Time	Message	Current Highest Bid	Current Highest Bidder
	10:05 Am	Auction Begins		
	10:05 Am	Bidder 1 Bids \$100	\$100	Bidder 1
10	10:06 Am	Bidder 2 Bids \$110	\$110	Bidder 2
	10:07 Am	Bidder 1 Bids \$115	\$115	Bidder 1
	10:08 Am	Bidder 3 Bids \$130	\$130	Bidder 3
	10:15 Am	Auction Ends	\$130	Bidder 3
	10:15 Am	Bidder 3 Wins		

15 Once the auction is completed, the various buyers B<sub>1</sub>, B<sub>2</sub>, B<sub>3</sub> are informed who has been successful and the connections between the various peers are brought down, save that the successful buyer B<sub>3</sub> can remain in contact with the seller A to arrange for exchange of the item and the agreed payment.

20 In a situation where a buyer is offline so that their terminal cannot participate in an auction, the server 10 could act on their behalf in an automatic bidding scenario if it knows the maximum bid that buyer is prepared to make, and that buyer's preferred bid increment.

Turning finally to the second embodiment shown in Figure 8, a user's network computer 45 holds a list of IP addresses defining a group of other network computers 46A, 46B and 46C. An offer to sell or to buy is made by a seller or buyer agent to the IP addresses in the proxy list, so being sent to the group of other network computers 46A, 46B and 46C to inquire as to whether any of them wish to participate in auctions that match the offer criteria. In essence, the receiving network computers 46A, 46B and 46C are interrogated as to whether they run buyer or seller agents that hold a matching offer. If they do, they can report back to the sending or requesting network computer 45 so that a communications channel can be opened between the bidder and the seller for conduct of an auction. In this variant of the invention, matching is conducted at one or other of the sending and receiving network computers, most logically by the receiving network computer.

Each of the network computers on the proxy list may in turn be connected to other network computers 47A, 47B and 47C to which they can forward the request, thus forming the peer to peer daisy-chain or tree structure shown in simplified form in Figure 8. In this scenario, each network computer 45, 46 is connected to a few other network computers 46, 47, say three as shown, which are in turn connected to a few other network computers and so on. When searching for matches the request is forwarded to the network computers 46A, 46B and 46C to which the user's network computer 45 is connected. If no match is found on those network computers 46A, 46B and 46C defining the first level of the structure, then the request is forwarded to the second-level network computers 47A, 47B and 47C connected to the first-level computers 46A, 46B and 46C. This cascading process continues until a match is found, until a predetermined number of network computers or levels of the structure have been searched, or until a timeout brings the search to a close after a predetermined period of time.

In the Figure 8 approach, there is no need for a server. The requesting network computer 45 merely needs to have the IP address of one network computer 46, or the IP addresses of a few network computers 46A, 46B and 46C, for the chain or tree to begin. The necessary IP address(es) could be downloaded by the requesting network computer 45 from a web site or distributed with software. However, it would also be possible to download the necessary IP address(es) from a server 10 if needs be.

It would also be possible for a user's network computer 45 to broadcast over the network a request defining an offer in terms of the user's buying or selling criteria. If another network computer 46, 47 receiving the broadcast runs a buyer or seller agent that recognizes its user wishes to participate in an auction matching those criteria, it responds to the broadcast and the computers connect to each other for the auction to begin.

An advantage of the approach of Figure 8 is that it is possible to find participating network computers 46, 47 even when a server is down. It could thus be a fall-back to the architecture of Figure 1, to be used if there is no response from the server 10 in operation of the Figure 1 embodiment. A timeout can be set so that if no